

IN THE CLAIMS:

12. (currently amended) A hybrid active electronic and optical circuit integrated within a Silicon-On-Insulator (SOI) wafer, the SOI wafer including an insulator layer and an upper silicon layer having a thickness of less than 3 μ m, the hybrid active electronic and optical circuit comprising:

a relatively narrow waveguide located within the upper silicon layer of the SOI wafer for supporting the propagation of light, said relatively narrow waveguide having a thickness of less than 3 μ m;

an active electronic circuit positioned proximate the waveguide, wherein a flow of light through the waveguide can be altered depending on a property of the active electronic circuit;

a light deflector at least partially located in the upper silicon layer, the light deflector is configured to deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the relatively narrow waveguide; and

an evanescent coupling region at least partially located within the upper silicon layer, the evanescent coupling region including a gap region positioned between the light deflector and the relatively narrow waveguide for optically couples coupling the deflected light coupling portion into the waveguide, such that light emitted from the light deflector coupling portion can pass via the evanescent coupling gap region to the relatively narrow waveguide at a suitable mode angle; and

~~—— a light deflector at least partially located in the upper silicon layer, the light deflector is configured to deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the waveguide.~~

13. – 14. cancelled

15. (currently amended) The hybrid active electronic and optical circuit of claim 12, wherein the evanescent coupling gap region includes a substantially constant thickness gap portion.

16. (currently amended) The hybrid active electronic and optical circuit of claim 12, wherein the evanescent coupling gap region is ~~at least partially formed using an optically clear adhesive~~ includes a tapered gap portion.

17. cancelled

18. (original) The hybrid active electronic and optical circuit of claim 12, further including at least one optical device, wherein altering an electric voltage applied to the active electronic circuit affects a free carrier distribution in a region of the at least one optical device, and thereby changes an effective mode index of the at least one optical device.

19. cancelled.

20. (currently amended) The hybrid active electronic and optical circuit of claim 12, wherein the evanescent coupling gap region has a thickness of less than $0.5\mu\text{m}$.

21. – 28. cancelled

29. (original) The hybrid active electronic and optical circuit of claim 12, wherein the hybrid active electronic and optical circuit includes a Fabry-Perot cavity.

30. (original) The hybrid active electronic and optical circuit of claim 12, wherein the hybrid active electronic and optical circuit includes a wavelength division multiplexer modulator.

31. (original) The hybrid active electronic and optical circuit of claim 12, wherein the hybrid active electronic and optical circuit includes a diode.

32. (original) The hybrid active electronic and optical circuit of claim 12, wherein the hybrid active electronic and optical circuit includes a transistor.

33. – 36. cancelled

37. (original) The hybrid active electronic and optical circuit of claim 12, wherein the hybrid circuit includes one from the group of a p-n device, a field plated device, a Schottky device, a MOSCAP, and a MOSFET.

38. (currently amended) A hybrid active electronic and optical circuit integrated within a wafer, the wafer including an insulator layer and an upper silicon layer, the hybrid active electronic and optical circuit comprising:

a waveguide located within the upper silicon layer of the SOI wafer for supporting the propagation of light;

an active electronic circuit positioned proximate the waveguide, wherein a flow of light through the waveguide can be altered depending on a property of the active electronic circuit;

a light deflector at least partially located in the upper silicon layer, the light deflector configured to deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the relatively narrow waveguide; and

an evanescent coupling region at least partially located within the upper silicon layer, the evanescent coupling region including a gap region positioned between the light deflector and the relatively narrow waveguide for optically couples coupling the deflected light coupling portion into the waveguide, such that light emitted from the light deflector coupling portion can pass via the evanescent coupling gap region to the relatively narrow waveguide at a suitable mode angle; and

~~—— a light deflector at least partially located in the upper silicon layer, the light deflector is configured to deflect light impinging at the suitable incident angle to a suitable mode angle where light deflected by the light deflector enters the waveguide.~~

39. (new) The hybrid active electronic and optical circuit of claim 12, wherein the light deflector comprises an optical grating formed in the upper silicon layer.

40. (new) The hybrid active electronic and optical circuit of claim 12, wherein the light deflector comprises an optical prism formed in the upper silicon layer.

41. (new) The hybrid active electronic and optical circuit of claim 40 wherein the light deflector comprises regions of different effective mode indices to create a prism-like region in the upper silicon layer.

42. (new) The hybrid active electronic and optical circuit of claim 12, wherein the light deflector comprises an optical lens formed in the upper silicon layer.